Stanford

Doug James

Professor of Computer Science and, by courtesy, of Music

CONTACT INFORMATION

- **Administrative Contact**

  Chris Downey

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Bio

BIO

Doug L. James is a Full Professor of Computer Science at Stanford University (since June 2015), and is a consulting Senior Research Scientist at Pixar Animation Studios. He was previously an Associate Professor of Computer Science at Cornell University (2006-2015). He holds three degrees in applied mathematics, including a Ph.D. in 2001 from the University of British Columbia. In 2002 he joined the School of Computer Science at Carnegie Mellon University as an Assistant Professor, before joining Cornell in 2006. His research interests include computer graphics, computer sound, physically based modeling and animation, and reduced-order physics models. Doug is a recipient of a National Science Foundation CAREER award, and a fellow of both the Alfred P. Sloan Foundation and the Guggenheim Foundation. He received a 2012 Technical Achievement Award from The Academy of Motion Picture Arts and Sciences for "Wavelet Turbulence," and the 2013 Katayanagi Emerging Leadership Prize from Carnegie Mellon University and Tokyo University of Technology. He was the Technical Papers Program Chair of ACM SIGGRAPH 2015.

ACADEMIC APPOINTMENTS

- Professor, Computer Science
- Professor (By courtesy), Music
- Member, Bio-X

ADMINISTRATIVE APPOINTMENTS

- Full Professor, Computer Science, Stanford University, (2015- present)
- Consulting Senior Research Scientist, Pixar Animation Studios, (2015- present)
- Affiliated Faculty Member, Center for Computer Research in Music and Acoustics (CCRMA), Stanford University, (2015- present)
- Affiliated Faculty Member, Institute for Computational and Mathematical Engineering (ICME), Stanford University, (2015- present)
- Associate Professor, Computer Science, Cornell University, (2006-2015)
- Assistant Professor, Robotics Institute, and Computer Science Department, Carnegie Mellon University, (2002-2006)

HONORS AND AWARDS

- Katayanagi Emerging Leadership Prize, Carnegie Mellon University and Tokyo University of Technology (2013)

- Technical Achievement Award for Wavelet Turbulence, The Academy of Motion Picture Arts and Sciences (2013)
- Research Fellow, John Simon Guggenheim Memorial Foundation (2011)
- College of Engineering Excellence in Teaching (Douglas Whitney `61 Award), Cornell University (2008)
- Research Fellow, Alfred P. Sloan Foundation (2006)
- "Brilliant 10" young scientist, Popular Science magazine (2005)
- CAREER Award, National Science Foundation (2004)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Chair, Technical Papers Program, ACM SIGGRAPH (2015 - 2015)
- Associate Editor, ACM Transactions on Graphics (2005 - present)

PROGRAM AFFILIATIONS

- Institute for Computational and Mathematical Engineering (ICME)

PROFESSIONAL EDUCATION

- PhD, University of British Columbia , Applied Mathematics (2001)
- MSc, University of British Columbia , Applied Mathematics (1997)
- BSc, University of Western Ontario , Applied Mathematics (1995)

LINKS

- My Website: http://graphics.stanford.edu/~djames
- Old Cornell website: http://www.cs.cornell.edu/~djames

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Computer graphics & animation, physics-based sound synthesis, computational physics, haptics, reduced-order modeling

PROJECTS

- Sound Rendering for Physically Based Animation

Teaching

COURSES

2018-19

- Computer Graphics: Animation and Simulation: CS 348C (Win)
- INTERACTIVE MEDIA AND GAMES: BIOE 196, BIOPHYS 196, CS 544 (Aut)
- Introduction to Computer Sound: CS 141 (Spr)
- Introduction to Game Design and Development: CS 146 (Aut)

2017-18

- Computer Graphics: Animation and Simulation: CS 348C (Aut)
- Interactive Media and Games: CS 544 (Aut)
- Introduction to Game Design and Development: CS 146 (Aut)
- Mathematical Methods for Robotics, Vision, and Graphics: CS 205A (Win)

2016-17

- Computer Graphics: Animation and Simulation: CS 348C (Aut)
- Mathematical Methods for Robotics, Vision, and Graphics: CS 205A (Spr)

2015-16

- Mathematical Methods for Robotics, Vision, and Graphics: CS 205A (Spr)
- Physically Based Animation and Sound: CS 448Z (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Gilbert Bernstein

Doctoral Dissertation Advisor (AC)

Ante Qu, Jui-Hsien Wang

Master's Program Advisor

Jason Ginsberg, Caitlin Go, Juan Grau, Luis Perez Martinez

Publications

PUBLICATIONS

- **Dynamic Kelvinlets: Secondary Motions based on Fundamental Solutions of Elastodynamics** *ACM TRANSACTIONS ON GRAPHICS*
  De Goes, F., James, D. L.
  2018; 37 (4)
- **Toward Wave-based Sound Synthesis for Computer Animation** *ACM TRANSACTIONS ON GRAPHICS*
  Wang, J., Qu, A., Langlois, T. R., James, D. L.
  2018; 37 (4)
- **Regularized Kelvinlets: Sculpting brushes based on fundamental solutions of elasticity** *ACM Transactions on Graphics (TOG)*
  de Goes, F., James, D. L.
  2017; 36 (2)
- **Bounce Maps: An improved restitution model for real-time rigid-body impact** *ACM Transactions on Graphics (TOG)*
  Wang, J., Setaluri, R., James, D. L., Pai, D. K.
  2017; 36 (4)
- **Animating Elastic Rods with Sound** *Transactions on Graphics (TOG)*
  Schweickart, E., James, D. L., Marschner, S.
  2017; 36 (4)
- **Toward Animating Water with Complex Acoustic Bubbles** *ACM TRANSACTIONS ON GRAPHICS*
  Langlois, T. R., Zheng, C., James, D. L.
  2016; 35 (4)
- **Real-time sound synthesis for paper material based on geometric analysis** *Eurographics/ ACM SIGGRAPH Symposium on Computer Animation (2016)*
  Schreck, C., Rohmer, D., James, D., Hahmann, S., Cani, M.
  Eurographics Association .2016
- **Inverse-Foley Animation: Synchronizing rigid-body motions to sound** *ACM TRANSACTIONS ON GRAPHICS*
  Langlois, T. R., James, D. L.
  2014; 33 (4)
- **Eigenmode Compression for Modal Sound Models** *ACM TRANSACTIONS ON GRAPHICS*
  Langlois, T. R., An, S. S., Jin, K. K., James, D. L.

2014; 33 (4)

- **Physics-Based Character Skinning Using Multidomain Subspace Deformations** *IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS*
  Kim, T., James, D. L.
  2012; 18 (8): 1228-1240
- **Precomputed Acceleration Noise for Improved Rigid-Body Sound** *ACM TRANSACTIONS ON GRAPHICS*
  Chadwick, J. N., Zheng, C., James, D. L.
  2012; 31 (4)
- **Stitch Meshes for Modeling Knitted Clothing with Yarn-level Detail** *ACM TRANSACTIONS ON GRAPHICS*
  Yuksel, C., Kaldor, J. M., James, D. L., Marschner, S.
  2012; 31 (4)
- **Motion-driven Concatenative Synthesis of Cloth Sounds** *ACM TRANSACTIONS ON GRAPHICS*
  An, S. S., James, D. L., Marschner, S.
  2012; 31 (4)
- **Energy-based Self-Collision Culling for Arbitrary Mesh Deformations** *ACM TRANSACTIONS ON GRAPHICS*
  Zheng, C., James, D. L.
  2012; 31 (4)
- **Fabricating Articulated Characters from Skinned Meshes** *ACM TRANSACTIONS ON GRAPHICS*
  Baecher, M., Bickel, B., James, D. L., Pfister, H.
  2012; 31 (4)
- **Animating Fire with Sound** *ACM TRANSACTIONS ON GRAPHICS*
  Chadwick, J. N., James, D. L.
  2011; 30 (4)
- **Toward High-Quality Modal Contact Sound** *ACM TRANSACTIONS ON GRAPHICS*
  Zheng, C., James, D. L.
  2011; 30 (4)
- **Rigid-Body Fracture Sound with Precomputed Soundbanks** *ACM TRANSACTIONS ON GRAPHICS*
  Zheng, C., James, D. L.
  2010; 29 (4)
- **Efficient Yarn-based Cloth with Adaptive Contact Linearization** *ACM TRANSACTIONS ON GRAPHICS*
  Kaldor, J. M., James, D. L., Marschner, S.
  2010; 29 (4)
- **Subspace Self-Collision Culling** *ACM TRANSACTIONS ON GRAPHICS*
  Barbic, J., James, D. L.
  2010; 29 (4)
- **Harmonic Shells: A Practical Nonlinear Sound Model for Near-Rigid Thin Shells** *ACM SIGGRAPH Asia Conference 2009*
  Chadwick, J. N., An, S. S., James, D. L.
  ASSOC COMPUTING MACHINERY.2009
- **Skipping Steps in Deformable Simulation with Online Model Reduction** *ACM SIGGRAPH Asia Conference 2009*
  Kim, T., James, D. L.
  ASSOC COMPUTING MACHINERY.2009
- **Harmonic Fluids** *ACM SIGGRAPH Conference 2009*
  Zheng, C., James, D. L.
  ASSOC COMPUTING MACHINERY.2009
- **Staggered Projections for Frictional Contact in Multibody Systems** *ACM SIGGRAPH Conference 2008*
  Kaufman, D. M., Sueda, S., James, D. L., Pai, D. K.

ASSOC COMPUTING MACHINERY.2008

- **Optimizing Cubature for Efficient Integration of Subspace Deformations** *ACM SIGGRAPH Conference 2008*
  An, S. S., Kim, T., James, D. L.
  ASSOC COMPUTING MACHINERY.2008
- **Wavelet turbulence for fluid simulation** *ACM SIGGRAPH Conference 2008*
  Kim, T., Thuerey, N., James, D., Gross, M.
  ASSOC COMPUTING MACHINERY.2008
- **Fast modal sounds with scalable frequency-domain synthesis** *ACM SIGGRAPH Conference 2008*
  Bonneel, N., Drettakis, G., Tsingos, N., Viaud-Delmon, I., James, D.
  ASSOC COMPUTING MACHINERY.2008
- **Backward steps in rigid body simulation** *ACM SIGGRAPH Conference 2008*
  Twigg, C. D., James, D. L.
  ASSOC COMPUTING MACHINERY.2008
- **Simulating knitted cloth at the yarn level** *ACM SIGGRAPH Conference 2008*
  Kaldor, J. M., James, D. L., Marschner, S.
  ASSOC COMPUTING MACHINERY.2008
- **Six-DoF Haptic Rendering of Contact between Geometrically Complex Reduced Deformable Models** *IEEE TRANSACTIONS ON HAPTICS*
  Barbic, J., James, D. L.
  2008; 1 (1): 39-52
- **FastLSM: Fast Lattice Shape Matching for robust real-time deformation** *ACM SIGGRAPH 2007 Conference*
  Rivers, A. R., James, D. L.
  ASSOC COMPUTING MACHINERY.2007
- **Many-Worlds browsing for control of multibody dynamics** *ACM SIGGRAPH 2007 Conference*
  Twigg, C. D., James, D. L.
  ASSOC COMPUTING MACHINERY.2007
- **Mesh ensemble motion graphs: Data-driven mesh animation with constraints** *ACM TRANSACTIONS ON GRAPHICS*
  James, D. L., Twigg, C. D., Cove, A., Wang, R. Y.
  2007; 26 (4)
- **Time-critical distributed contact for 6-DoF haptic rendering of adaptively sampled reduced deformable models** *Symposium on Computer Animation*
  Barbic, J., James, D.
  ASSOC COMPUTING MACHINERY.2007: 171–180
- **Precomputed Acoustic Transfer: Output-sensitive, accurate sound generation for geometrically complex vibration sources** *ACM TRANSACTIONS ON GRAPHICS*
  James, D. L., Barbic, J., Pai, D. K.
  2006; 25 (3): 987-995
- **Skinning mesh animations** *ACM SIGGRAPH 2005 Conference*
  James, D. L., Twigg, C. D.
  ASSOC COMPUTING MACHINERY.2005: 399–407
- **Real-time subspace integration for St. Venant-Kirchhoff deformable models** *ACM SIGGRAPH 2005 Conference*
  Barbic, J., James, D.
  ASSOC COMPUTING MACHINERY.2005: 982–90
- **BD-Tree: Output-sensitive collision detection for reduced deformable models** *Annual Symposium of the ACM SIGGRAPH*
  James, D. L., Pai, D. K.
  ASSOC COMPUTING MACHINERY.2004: 393–98
- **Precomputing interactive dynamic deformable scenes** *Annual Symposium of the ACM SIGGRAPH*
  James, D. L., Fatahalian, K.

ASSOC COMPUTING MACHINERY.2003: 879–87

- **Multiresolution Green's function methods for interactive simulation of large-scale elastostatic objects** *ACM TRANSACTIONS ON GRAPHICS*
  James, D. L., Pai, D. K.
  2003; 22 (1): 47-82

- **DyRT: Dynamic response textures for real time deformation simulation with graphics hardware** *SIGGRAPH 2002 Meeting*
  James, D. L., Pai, D. K.
  ASSOC COMPUTING MACHINERY.2002: 582–85

- **Real time simulation of multizone elastokinematic models** *19th IEEE International Conference on Robotics and Automation (ICRA)*
  James, D. L., Pai, D. K.
  IEEE.2002: 927–932

- **Scanning physical interaction behavior of 3D objects** *SIGGRAPH 2001*
  Pai, D. K., van den Doel, K., James, D. L., Lang, J., Lloyd, J. E., Richmond, J. L., Yau, S. H.
  ASSOC COMPUTING MACHINERY.2001: 87–96

- **ArtDefo - Accurate real time deformable objects** *26th International Conference on Computer Graphics and Interactive Techniques*
  James, D. L., Pai, D. K.
  ASSOC COMPUTING MACHINERY.1999: 65–72

PRESENTATIONS

- Physics-based Animation Sound: Progress and Challenges - 2014 SIAM Annual Meeting (July 11, 2011)